

ABSTRACT

This invention provides an imaging system that can adaptively clock the component subsystems based upon the processing schedules of these subsystems. Additionally, the invention provides an adaptively enabled multi-processor system based upon these processing schedules. The imaging system acquires image data through an acquisition system, that performs rudimentary processes on the image data and then presents this data to either a raw image buffer or to processing circuitry. The processing circuitry makes a series of computations on the raw image data to generate a processed image. This processed image is then sent to compression or transformation circuitry, which transforms the processed image data into commonly used formats, or further compresses the image data for storage or additional formatting purposes. If the processing circuitry operates at a slower rate than the acquisition circuitry, the overflow raw image data may be sent to a raw image data queue. Accordingly, a higher rate of acquisition of raw images will not be disturbed unless and until the imaging system determines that additional images would be compromised. The imaging system can determine whether to adaptively slow the acquisition circuitry to the speed of the processing circuitry based upon the amount of raw image data present in the raw image data buffer. When the amount of raw image data in the raw image data queue exceeds a certain threshold, the imaging system may allow acceleration of the acquisition system. Additionally, a processed image data queue may be present in the imaging system. Processed image data is either presented to the processed image data queue or to a compression or transformation circuitry. Again, if the compression or transformation circuitry is overwhelmed by the amount of data from the image processing circuitry, the imaging system may direct slowing of the image processing circuitry. Or, the imaging system may direct that additional redundant processing circuitry be enabled as needed to compensate for the additional workload. The imaging system may also direct that the redundant component circuitry be disabled when no longer needed.